Consulting of improving energy efficiency of buildings

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GRANLUND

International seminar on

Improvement of energy efficiency of buildings

Helsinki 5th October

Contents

- **Company**
- **Energy Efficiency in building process**
- **Reporting Building System for Operation Phase**
- **Energy auditing in Finland**
- **Energy auditing projects in Russia**

Company

Activities

- Building services design
- Facilities management consulting
- Design and facilities management software
- Special consulting services

Offices

- Headquarters: Helsinki
- Subsidiaries: Finland (4 offices)
  Tallinn, Moscow

Figures

- Founded 1960
- Personnel 300
- Export % 15

Services

Building services design

- HVAC
- Fire protection
- Building automation
- Hospital
- Electrical
- Telecommunication
- Security engineering
- Audiovisual design

Facilities management consulting

- FM software
- FM consulting
- Energy auditing
- Supervision, commissioning
- Condition assessments
- Remote access monitoring

Special consulting services

- Energy simulation
- CFD simulation
- 3D visualization
- Life cycle analysis
- Analysis services for HVAC

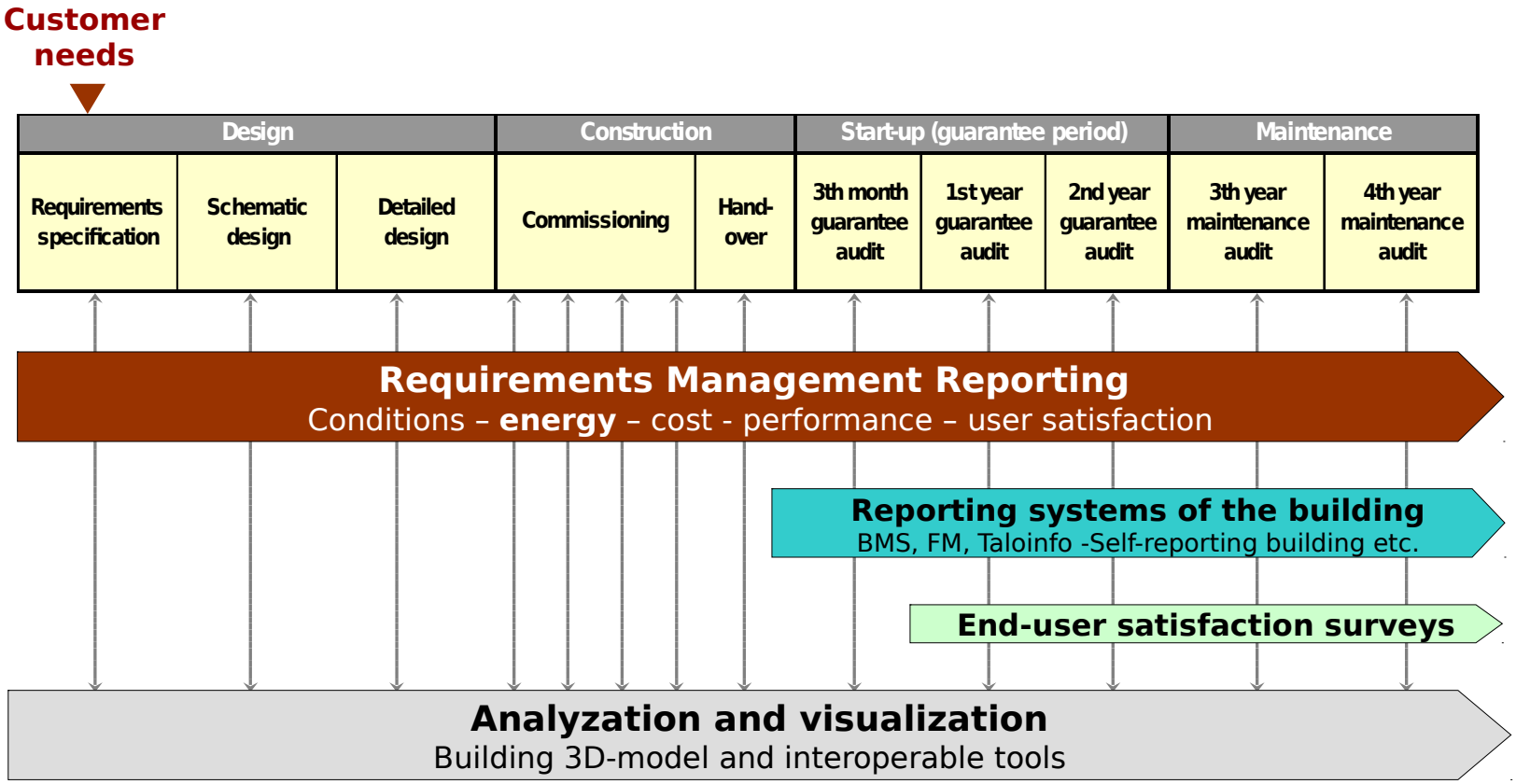
Development

- Design methods
- Integrated software tools for design and FM
- Energy research
- Environmental and sustainable buildings
- International partnerships

BildMet

- **BildMet - Integrated Building Performance Metrics Concept**
  - Finland: Granlund, Halton, TAC
  - USA: CIFE - Center for Integrated Facility Engineering
    LBNL - Lawrence Berkeley National Laboratories
    CBE – Center for the Built Environment
    GSA – U.S. General Services Adminstration
  - Pilot projects with building owners: Nokia, Senaatti
  - Tekes funding to the end of 2006
- **Granlund's focus**
  - Requirements management for building life cycle process
  - Information management of real estate business (further development of BIC)
  - Performance management services – TTT Healthy Building Makers
  - Development of integrated tools using building product models

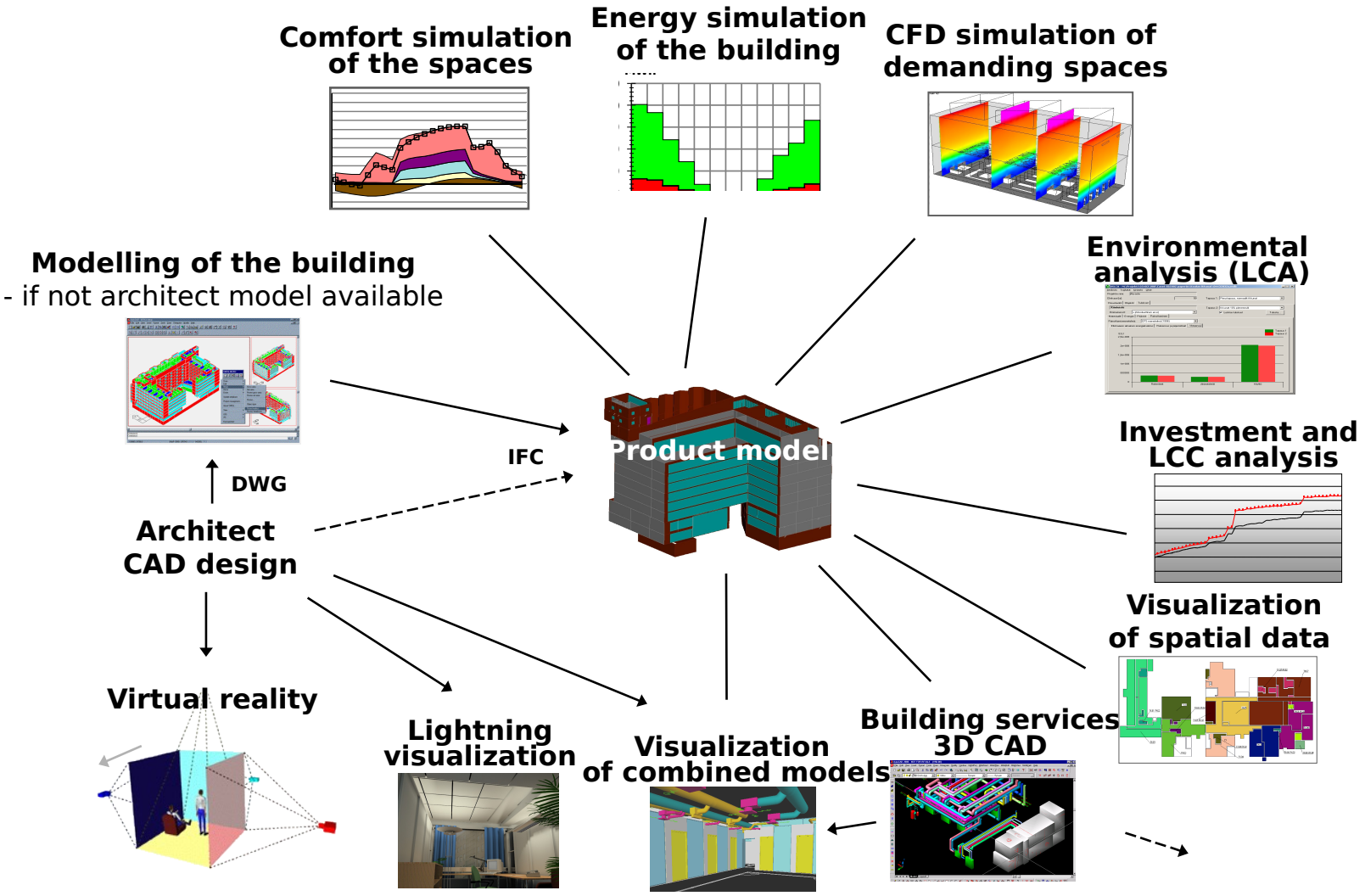
BildMet Concept - Building Performance Management



Reporting

- Owner, end-users, FM management
- Project management, designers, contractors

Analysis and Visualization by Building Product Model

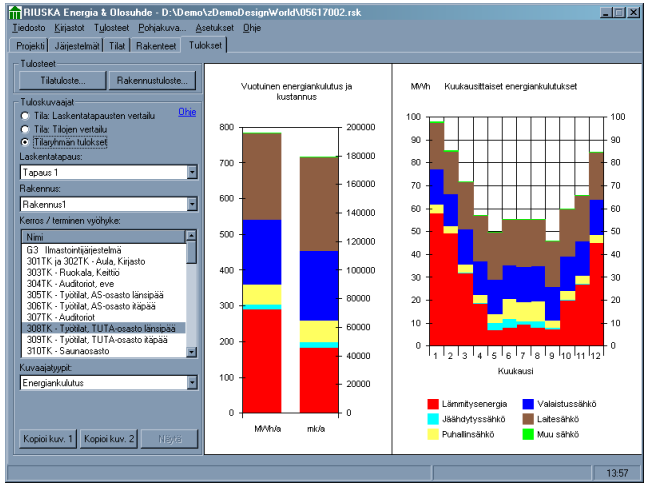


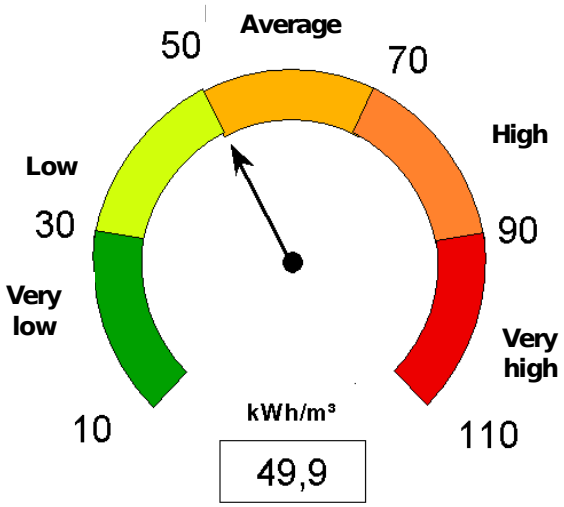
Energy simulation

RIUSKA™ ENERGY

- Energy consumption of buildings and systems
- Comparisons of windows, facades, technical systems, indoor air quality,...
- Target energy consumption for FM

TECHNICAL
- Simulation engine DOE 2.1E
- Certified IAI/IFC IFC 1.5.1, 2.0 and 2x

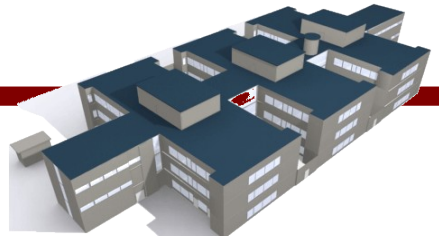




GRANLUND SOFTWARE

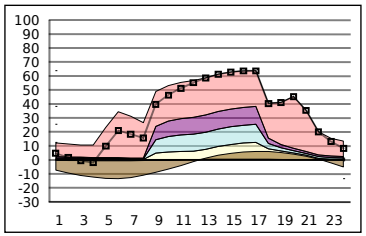
Self-Reporting Building System by Granlund Taloinfo

Building Performance



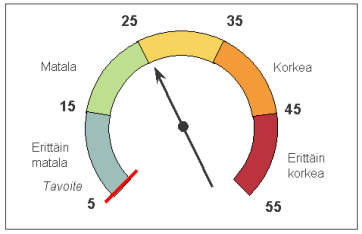
Self-reporting Building

Comfort simulation
RIUSKA



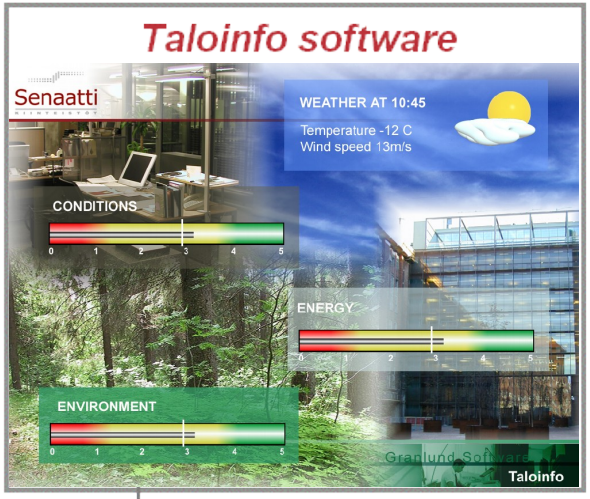
Design targets, loads

Energy simulation
RIUSKA



Updated energy targets

Measureddata of use/loads



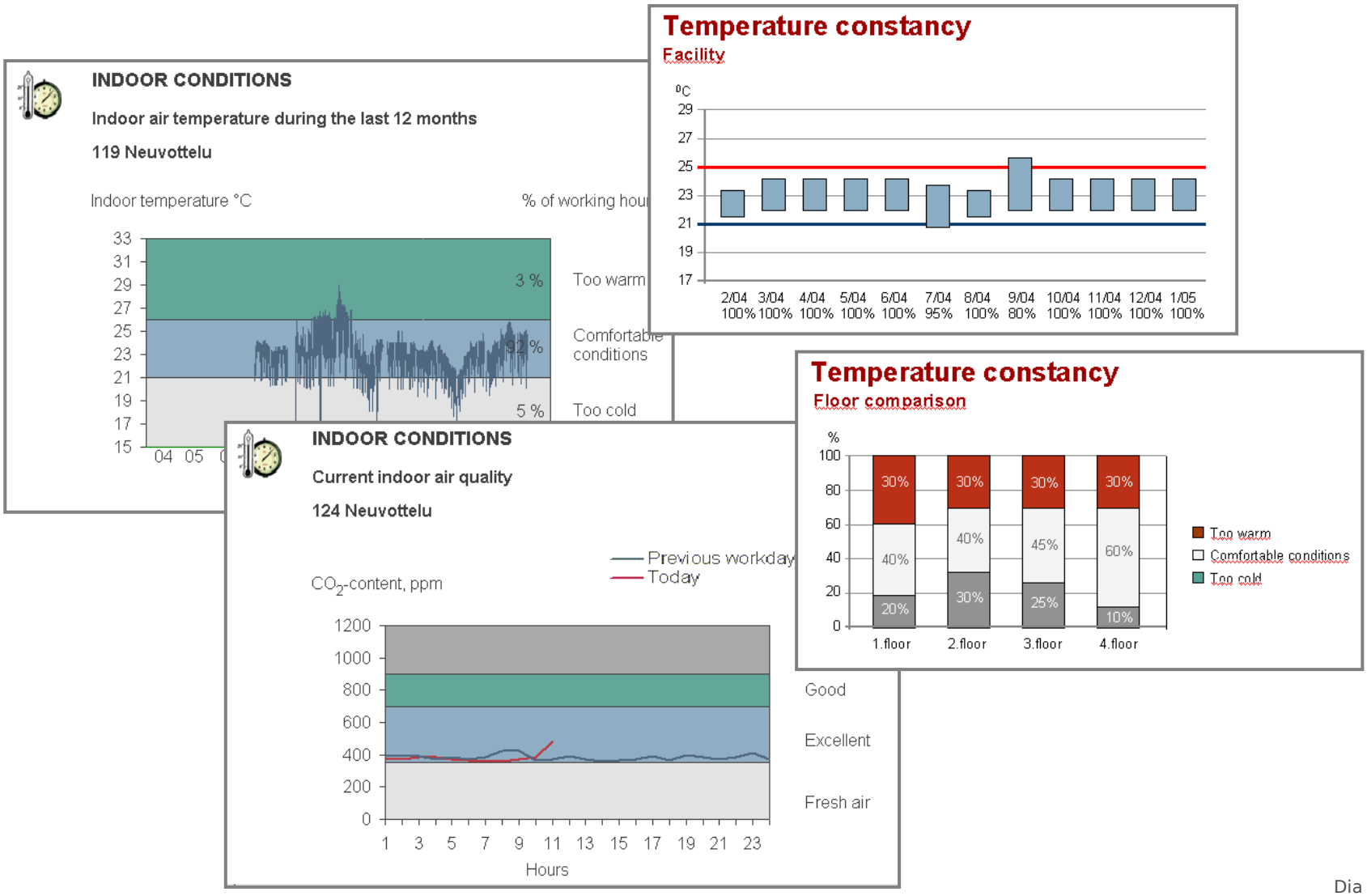
XML interface

Energy measuring
Access control
Building automation
Facilities management

Examples of comfort related reports

Granlund Software

Taloinfo *Reporting facility*



Examples of energy related reports

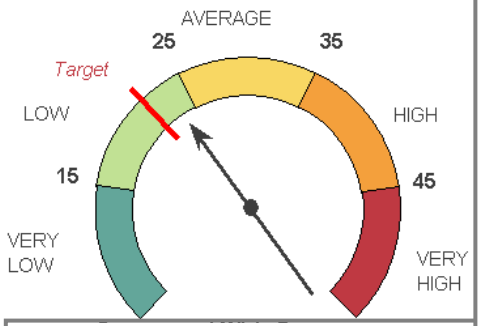
Granlund Software

Taloinfo *Reporting facility*

ENERGY ECONOMY

Heating energy consumption this year

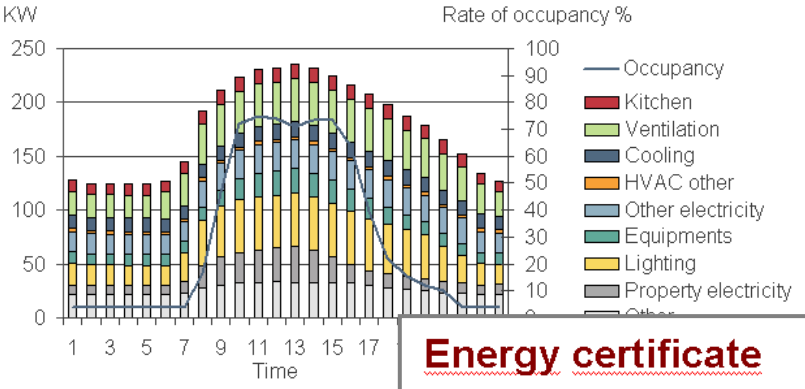
Whole building



ENERGY ECONOMY

Average electricity consumption during a working day

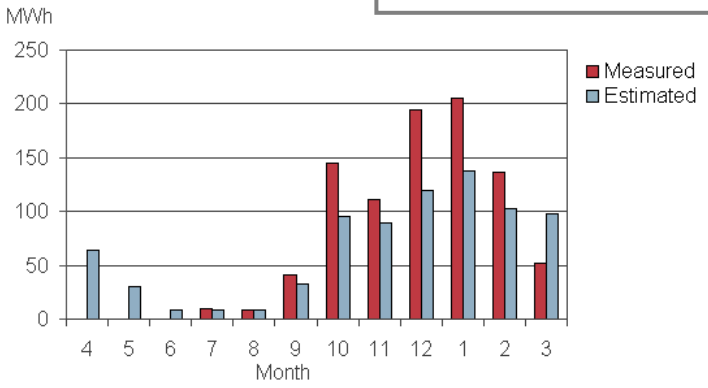
Whole building



ENERGY ECONOMY

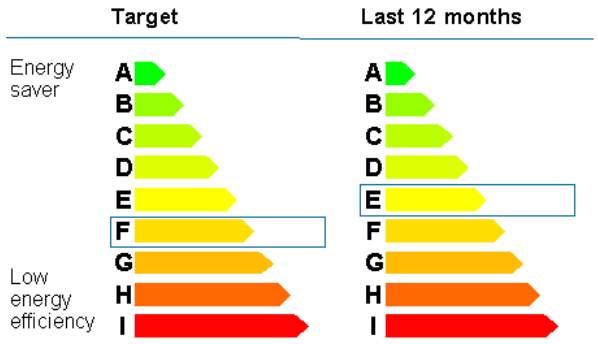
Heating consumption during the last

RAK Lintulahdenkatu 5

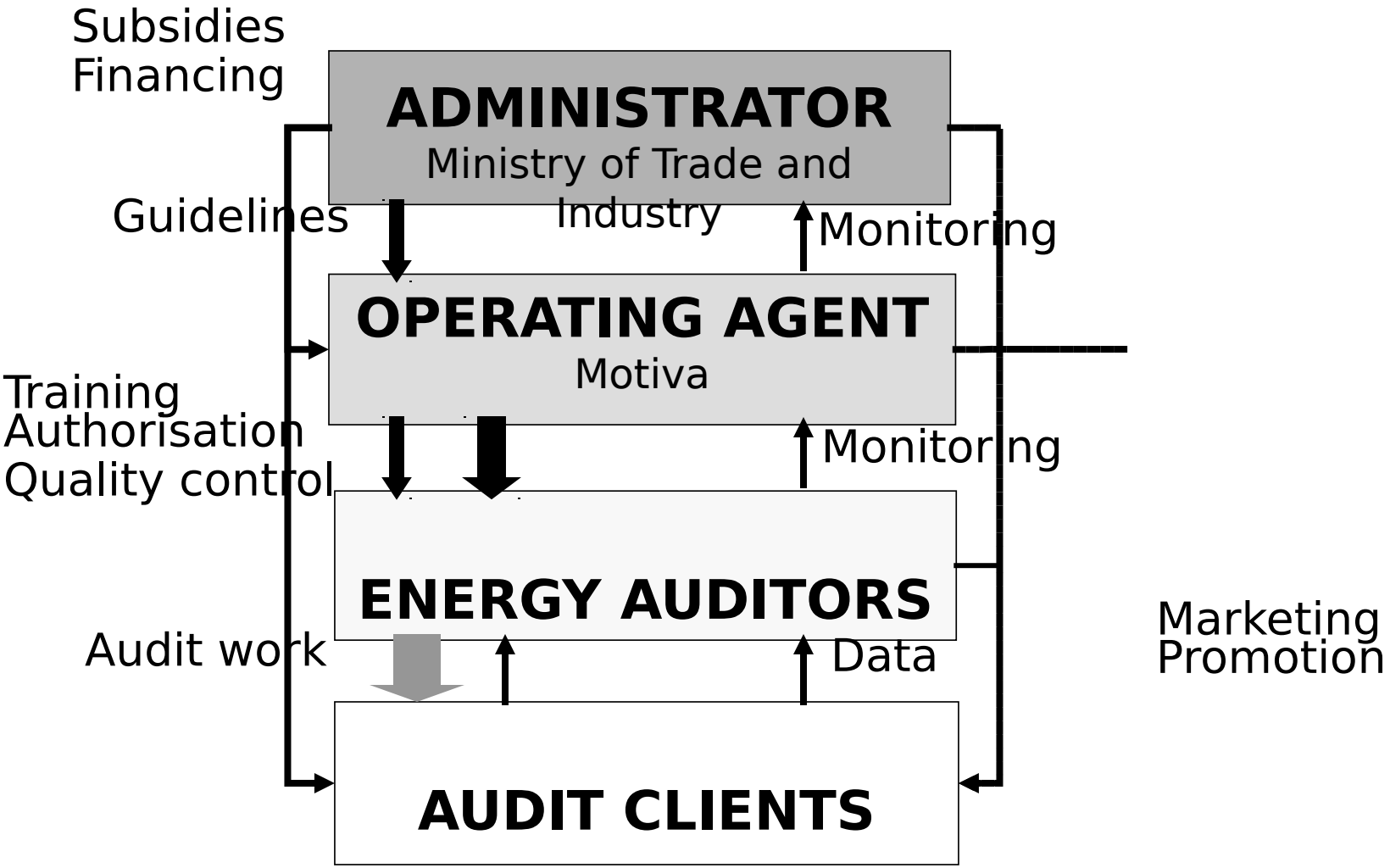


Energy certificate

EU directive 2002/91/EY



Finland's Energy Audit Programme



Source: Motiva

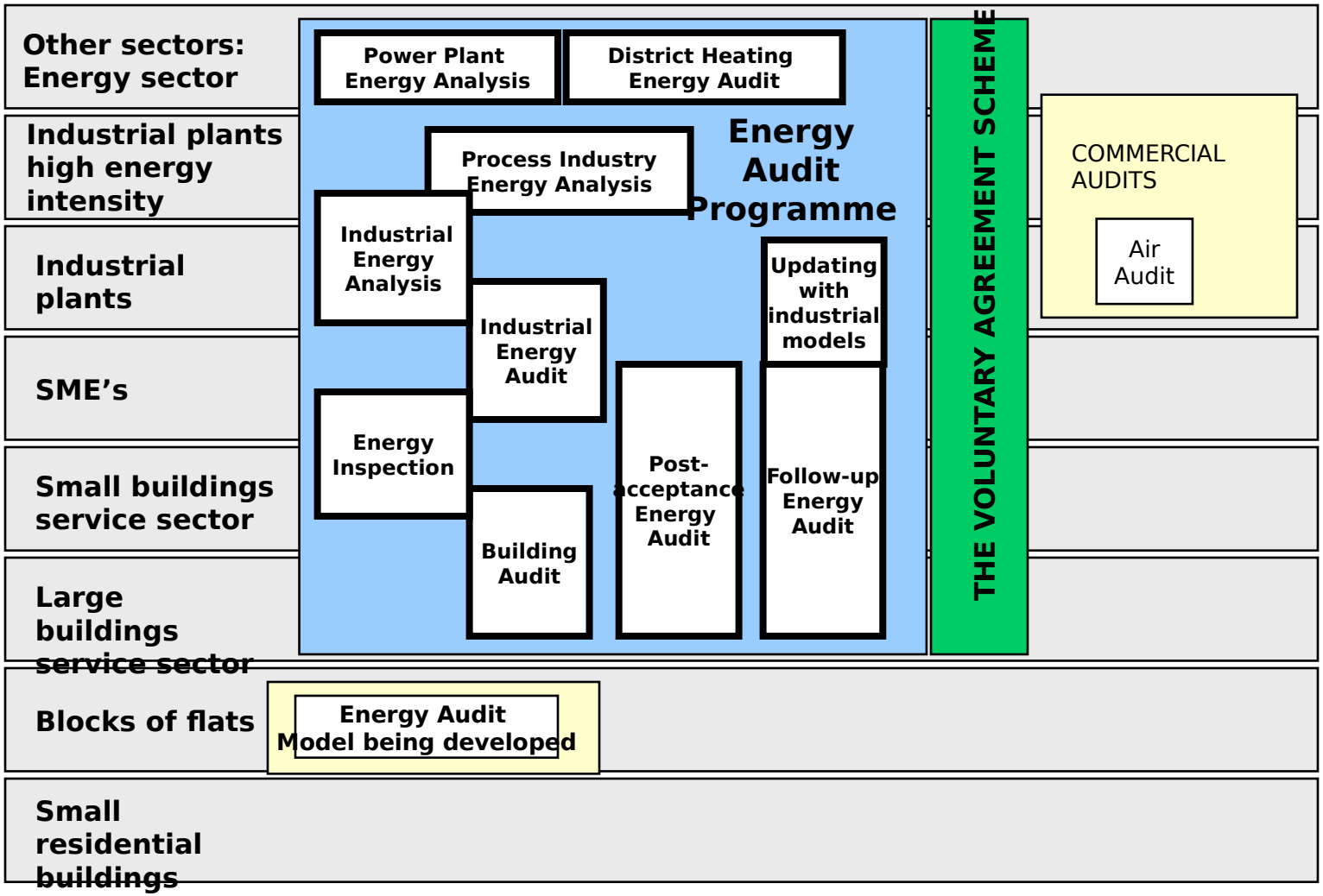
Energy Audits

- **Energy audit means a systematic procedure where the purpose is to**
  - evaluate the existing energy consumption
  - identify of the saving measures
  - report the findings

...limited to existing buildings/sites/objects.

Source: Motiva

Energy Audit Models



KEEPING WARMTH - REALISATION OF EUROPEAN ENERGY EFFICIENCY PROGRAM GOALS IN MURMANSK REGION

TACIS/2003/060-992/22

Introduction and goals of the Murmanski project

to introduce strategy and methods of realisation of the European energy saving programs in the Murmansk region to increase energy efficiency and rationalise energy use in the region.

- to encourage municipal energy saving program in the housing sector.

- The main activities include realisation of a pilot energy audit project in Murmansk Regional Hospital in compliance with the international standards.

- Creation of an energy audit agency under the auspices of Murm Oblast Administration is a basis of the project realisation.

- The target groups are municipal authorities, municipal energy organisations and housing companies, energy efficiency centers and property owners.

Planned implementation

- Analyses of Russian legal base and norms on energy supply
- Creation of the energy efficiency laboratory technical l
- **Energy auditor training (PHARE Senet project)**
- Purchase and localization of the foreign audit software
- **Pilot project of the energy audit of the building (Murmansk Regional Hospital)**
- Dissemination

Energy auditor training

- The auditor training was subcontracted to Insinööritoimisto Olof Granlund Oy.

- The goal of this energy audit training is to teach local specialists from Murmansk region to best methodology and best practices used in Finland.

- The energy audit training of the project was provided in several sessions and in based on typical Finnish training of Energy Auditors and the training was expanded to me requirements of Russian partners and requirements of the project.

- Pilot audit of Murmansk hospital

Energy auditor training

- **Training session 1 in Finland (2-3 days)**

-basics of energy auditing

-energy auditing in Finland

-energy audit procedure and different audit models

- **Seminar in Murmansk**

-acquainting to local conditions

-selection of pilot sites

- **Training session 2 in Finland (2-3 days)**

-energy auditing in practice

-measurements

- **Training session 3 in Finland**

-discussion and comments on the audit report from the pilot s

-implementation of suggested measures, ESCO-activity development of audit procedures